

The Triangular Distribution

1. Parameters

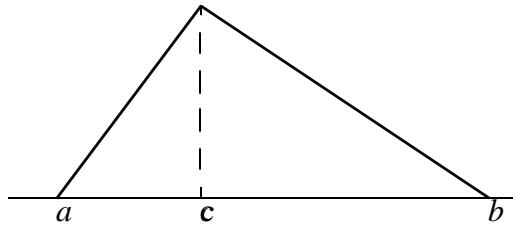
a = smallest possible value

b = largest possible value

c = mode

2. Probability Density Function

$$f_X(y) = \begin{cases} \frac{2(y-a)}{(b-a)(c-a)}, & a \leq y \leq c \\ \frac{2(b-y)}{(b-a)(b-c)}, & c \leq y \leq b \\ 0, & \text{otherwise} \end{cases}$$



3. Cumulative Distribution Function

$$F_X(y) = \begin{cases} 0, & y < a \\ \frac{(y-a)^2}{(b-a)(c-a)}, & a \leq y \leq c \\ 1 - \frac{(b-y)^2}{(b-a)(b-c)}, & c \leq y \leq b \\ 1, & y > b \end{cases}$$

4. Inverse Cumulative Distribution Function

$$F_X^{-1}(u) = \begin{cases} a + \sqrt{u(b-a)(c-a)}, & 0 < u < \frac{c-a}{b-a} \\ b - \sqrt{(1-u)(b-a)(b-c)}, & \frac{c-a}{b-a} < u < 1 \end{cases}$$

5. Moments

$$\mu = \frac{a+b+c}{3}$$

$$\sigma^2 = \frac{a^2 + b^2 + c^2 - ab - ac - bc}{18}$$